Collaborative participatory research as a learning process: the case of CIP and CARE in Peru.

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Abstract:

Participatory research (PR) has been analyzed and documented from different points of view, but particularly taking into consideration the benefits that this process generates for farmers. Studies of the benefits of PR for other actors such as field staff, researchers and organizations have been limited, with organizational learning receiving the least attention. This paper analyzes the interaction between the International Potato Center (CIP) and CARE in Peru and makes the case that PR can also contribute to creating a collaborative learning environment that generates important lessons for the individuals and organizations involved. The paper describes the evolution of the collaborative environment of these two institutions for more than a decade. Three interactive learning periods are presented, namely the "information transfer period" (1993 –1996) the "action-learning period" (1997-2002), and the "social learning period" (on-going). Several lessons from each period, as well as changes in institutional contexts and perceptions, are described. The CIP-CARE case shows that research and development-oriented organizations can interact fruitfully using PR as a mechanism to promote learning, as well as flexibility in interaction and innovativeness, and that a process of osmosis of information occurs between groups that use PR in a specific case to other groups within the organizations, influencing behavior. However, the paper also indicates that institutional learning should be promoted more specifically in order to extract guidelines from the lessons, which can influence the way organizations plan and implement their projects in a constantly changing environment.

Introduction.

Participatory research (PR) --in its different forms-- has usually been perceived as bringing more benefits for the final users of the technologies, who are the farmers involved in the research process. While the experience of conducting participatory

research can also bring benefits to other actors such as field staff, development practitioners and researchers, there is less evidence in the literature about what PR means to these actors, and particularly what PR means to institutional actors.

Currently, institutions are interested in learning from their experiences, particularly when new challenges are presented. For example, the International Potato Center (CIP) recently defined a new vision, which aims at contributing more efficiently to the Millennium Development Goals. This, in practice, means bringing research closer to development efforts. This paper describes the process by which an international research institution (the International Potato Center or CIP) and an international development NGO (CARE) have worked collaboratively and have used PR increasingly as a mechanism to promote inter-institutional, collaborative learning.

The use of participatory research methods at CIP played an important role during the 1980's when CIP's contribution to PR thinking in the farmer-back-to-farmer model (Rhoades and Booth, 1982) was very influential. However, during the late 1980's and 1990's, PR at CIP constantly changed and evolved (Thiele et al 2001). The CIP-CARE case presented here describes only a part of such evolution.

In the early 1990's, CIP and CARE-Peru initiated the process of learning how to work together. Although there has not been a formal mechanism for documenting and using lessons learned by both organizations over the years, this paper is an attempt to systematize the learning process of more than a decade of collaboration.

Institutional learning in the CIP and CARE contexts

The concept of learning institutions (Hall et al., 2003; Watts, et al., 2003) has been discussed to explain a desirable characteristic of modern organizations, which continuously adapt their internal structures to the external environment. The adaptation should be the result of reflecting on experiences and learning from interaction, taking into consideration the contexts in which institutions operate. "Interactive learning" has been highlighted as a process by which institutions learn through interaction. However, the process of interactive learning in agriculture-related organizations financed by public funds has not been explored sufficiently in literature. In this paper, we use the terms parallel or mutual learning as synonyms for interactive learning.

Inter-institutional learning is part of a wider concept related to the innovation systems approach (Lundvall, et al. 2002; Hall, et al. 2004; Gurung and Menter, 2004). This approach proposes that innovation occurs when organizations interact and exchange information and knowledge; and that not only research organizations are able to generate innovation (new and improved ways of solving problems), but that entrepreneurial and non-governmental organizations from both the public and private sectors can be driving forces for innovation. Thus, interactive learning is essential for generating innovation.

The "learning selection" theory (Douthwaite, 2002) explains how successful innovations are the result of continuous cycles of action-experience-making sense-drawing conclusions, and explains that adjustments are made to the innovation in each cycle until it reaches a point of sufficient maturity for wider adoption. This theory could also be used for analyzing the learning process of CIP and CARE, in which the collaborative activities related to PR represented a learning selection process, but in a parallel way with implications for both organizations. In addition, other parallel learning processes were occurring at CIP in other parts of the world, particularly in Asia (van de Fliert and Braun, A. 1999)

In the case of CIP and CARE, interest in learning from institutional experiences has been growing over the years. The reason for this is that both institutions have passed from an activist phase in the early 1990's when the main goal was to implement research or training activities, following the pipeline mode. At that time, individuals within the organizations perceived that there were a few clear questions related to agricultural development. Researchers were initially thinking of narrow technical problems, for example, "how to control the Andean potato weevil" for which there were also clear technical answers. Over the years researchers came to look at issues in a wider context, including not only productivity but also livelihoods, sustainability and other poverty-related factors. In recent years CIP and CARE have started to use a more reflective mode (in accordance with ideas from the innovation systems concepts of Lundvall et al., 2002), where there are more complex questions; for example, "How can potato production be made more competitive and sustainable for resource-poor farmers?" Nevertheless, no straightforward answers exist to the new complex questions. Hence, organizations have started to take interest in exploring and reflecting on possible answers to these complex questions.

Participatory research through inter-institutional interaction as a learning process

There is extensive literature related to participatory research, justifying it from different perspectives. Particular emphasis is placed on participatory research as a vehicle for incorporating farmer perspectives in the research process and improving the possibility of developing suitable technologies, placing emphasis on developing farmers' own research processes (Okali et al., 1994; Johnson et al., 2000). It has also been pointed out that participatory research fosters empowerment and strengthens social and human capital at the individual farmer level. In summary, in most of the studies, the importance of participatory research has been justified as bringing benefits for farmers, but fewer studies have focused on the importance of participatory research as a learning process for institutions or individuals within institutions.

Ties between research and development organizations are frequently weak or absent in developing countries, and the need for strengthening the interaction between these organizations has been pointed out by several authors (Biggs, 1981; Reddy, 1986; Kaimowitz, 1990). In response to this, partnership approaches have been pointed out as

appropriate mechanisms for bringing together institutions with different comparative advantages that work towards common objectives (Thrupp, 1996).

The development of concepts and methods related to participatory research at CIP can be traced back to the 1980's when influential papers such as the one on "farmer-back-to-farmer" approach (Rhoades and Booth, 1982) were written. Thiele et al. (2001) analyze the evolution of participatory research at CIP, indicating that there have been several different periods. There was a period when participatory methods emerged between 1975 and 1980. Another period was when participatory approaches began to be implemented with NARS between 1981 and 1989. Thiele et al. also indicate that there was a period of "fragmentation" between 1990-1996 when a number of parallel experiences began to be conducted in different regions where CIP worked; and the last period, which started in 1997, when FFS became central to CIP's strategy for PR. The experience of CIP and CARE contributed to the last two stages of the evolution of PR at CIP, and was one of several experiences related to the implementation of PR in a collaborative way. In recent years, some CIP researchers have started to look at PR as a mechanism by which research and development-oriented organizations can work together and learn how to respond more efficiently to farmer needs. This is essential for organizations like CIP that are interested in improving their contribution toward reaching goals such as alleviating poverty and hunger.

The parallel learning process of CIP and CARE

This paper presents the case of CIP and CARE-Peru, which have interacted for more than a decade. Interactive learning (Hall et al., 2003, 2004; Watts, et al., 2003), which is also called parallel or mutual learning in this paper, has occurred in the relationship between the two institutions, but it has not been carefully documented, and in many cases lessons have been incorporated in institutional behavior with no documentation. Unfortunately, in other cases, lessons have been lost because of the lack of specific mechanisms for documentation.

This paper makes the case that for interactive parallel learning to occur, learning environments in which actors (individuals or group) take part must be fostered, and that PR provides a suitable learning environment when formalized in inter-organizational mechanisms. Institutional learning and change does not occur unless individuals go through a learning process with a suitable environment and are able to learn from their own experiences. Individual and group experiences within organizations tend to be isolated cases of innovation at the beginning; but slowly these experiences and, particularly, the lessons learned start to permeate and influence other individuals and groups within the organizations, which are at the same time engaged in their own learning processes. This process is called osmosis of information in this paper, because information about methods or technologies tends to be passed from groups where there is higher concentration of knowledge (because of the accumulation of experience) to

groups with less available information. Osmosis of information is explored in more detail in the "social learning period" section.

It is interesting to differentiate private and public organizations regarding innovativeness. Whereas the former tend to have less room for individual innovation (usually the firms innovate as a whole and that influences group behavior), in the latter there is more room for individual innovation, promoted, in the case of CIP and CARE, by scientists and development practitioners who are constantly looking for new ways of doing things.

The case of CIP and CARE shows a model of parallel learning processes that have occurred throughout the years consisting of the coexistence and mutual influence of the CIP and CARE organizational environments and collaborative learning environment (Figure 1). The model describes three periods of the collaborative learning environment, in which each period corresponds to a distinct effort, characterized by a specific team and a particular grant and donor. In this particular case, the learning periods include 1) the 'information transfer period', 2) 'action-learning period' and 3) the 'social learning period', which influenced, and were influenced by, the two evolving and interrelated organizational environments. First, the internal organization of CIP, within which the importance of participatory research has been changing over the years and a number of parallel learning cycles have occurred during the last decade (Thiele et al. 2001; Prain et al 2005). Second, the internal organization of CARE-Peru, which has also been changing from an approach based on providing assistance to the poor to an approach based on strengthening local capacities for development. The focus of the paper is on the evolution of the collaborative learning environment and the lessons learned, which in turn contributed to the internal discussions related to PR within both institutions. The paper also discusses the importance of learning promoters, called "champions" by Douthwaite (2002), who generate promising ideas and promote learning and selection cycles. In the CIP-CARE case, there have been individuals who have gone through the different learning periods and have been key to maintaining and promoting inter-institutional learning.

Before CIP and CARE started interacting in 1993, Fano et al. (1996) indicate that CIP had problems in disseminating research results because of radical changes in the Peruvian governmental research and extension system, which was severely reduced due to the structural adjustment of the Peruvian agricultural sector. Therefore, CIP was searching for new partners for disseminating its research results, particularly those related to the integrated management of the Andean potato weevil and the potato tuber moth (Cisneros at al, 1995).

During the late 1980's CARE was using approaches based on providing assistance to the poor in rural areas, which included subsidizing services and in some cases goods. In the early 1990's, CARE initiated some changes oriented toward reducing the promotion of pesticides within their projects. Consequently, the CARE staff was in search of

information about alternative strategies for pest control, particularly non-chemical measures. This was the first coincidence of objectives of CARE and CIP that started generating a suitable environment for initiating collaboration.

In the following sections of the paper, the evolution of the collaborative learning environment generated by the interaction of CIP and CARE is described, including some of the main lessons learned by each institution according to changes in their contexts.

The "information transfer period"

The first phase of the CIP-CARE collaborative learning environment is called the "information transfer period". It began in 1993 and was a response to common objectives of both institutions related to the promotion of sustainable methods of pest control, and also to changes in the Peruvian agricultural context characterized by a dramatic reduction of government research and extension systems. This phase began with a shared perception of clearly defined roles. On the one hand, CIP was perceived as the "source" of the technical information on integrated pest management (IPM) for controlling the Andean potato weevil (APW) and potato tuber moth (PTM). CIP developed interesting IPM technologies in pilot units, also including participatory methods (Cisneros et al., 1995; Thiele et al., 2001), and the IPM team at that time included the Social Scientist (Extension specialist) who collaborated with entomologists. On the other hand, the role of CARE was defined as the "vehicle" that would make the information available to farmers because it had extension infrastructure and sufficient logistical support. Farmers were defined as the "recipients" of the information. That was a stage at which the technology transfer and pipeline approach was still dominant in both groups, and the roles of researchers and extension workers were clearly differentiated. Initial informal contacts between key staff from CARE's Unit for Agriculture and Natural Resources Management, and staff from the IPM program of CIP materialized in a formal, collaborative, three-year project called the MIP-Andes project, which was financed by USAID. The project was aimed at disseminating IPM for the potato crop in communities in four areas of the Peruvian highlands, specifically Cajamarca, La Libertad, Ancash and Puno (Chiri et a., 1995, 1996; Ortiz, 1997). Of these four initial sites in the first learning period, only in Cajamarca have learning activities continued in the other two periods.

The pre-defined roles facilitated the initial implementation of the project, in which CIP scientists trained CARE extension workers on the technical content of IPM. Ortiz (1997) indicates that CIP gave emphasis to providing training on the technical component of the technology, but no emphasis was given to improving the skills of CARE field staff related to teaching IPM to farmers. Most of the first year of the project was oriented toward improving the technical capabilities of CARE staff (including enhancing knowledge related to insect biology and behavior), starting to produce training materials and implementing some training activities for farmers.

However, as soon as extension workers started to transfer information about IPM, using methods similar to those they had used in the past to transfer information about pesticides, they realized that the information about IPM was more complex and difficult to transfer using conventional methods. CARE experience showed that innovative methods were needed in order to facilitate farmers' learning of complex concepts related to IPM. This lesson initially learned by CARE field staff was communicated to CIP staff during supervision visits. As a result, researchers also realized that the complexity of implementing IPM on a large scale demanded innovative ways of working with farmers.

The collaborative learning environment generated by the project helped staff of both institutions to learn that technical information was not enough to implement IPM because it was a knowledge-intensive technology that required appropriate methods to work and communicate with farmers in the Andes (Ortiz et al., 1996; Ortiz, 2001). During the second and third year of the MIP-Andes project, efforts were made by both institutions to improve communication with farmers; and CARE extension workers were very active in developing new ways of explaining complex concepts to farmers. Unfortunately, these innovative training methods were not documented because there was no specified output of the project related to developing training methods. In other words, the outputs of the MIP-Andes project were oriented toward training farming families and reducing the percentage of damage caused by potato pests, regardless of the methods used, with a clear lack of interest in documenting processes.

For CIP researchers, this was the first opportunity to test technologies developed in specific pilot units in Cusco and Cajamarca (Cisneros et al., 1995) in a wider context. The complexity of conditions at the locations where the MIP-Andes project was implemented contributed toward generating another lesson for researchers and extension workers, related to the need to conduct participatory research to fine-tune technologies. Within CIP, other groups of researchers were generating their own learning processes and similar conclusions were drawn in other locations in Latin America and Asia (Thiele et al., 2001; Prain et al., 2005). Therefore, at the end of the "information transfer period", the CIP-CARE experience and other parallel learning processes within CIP started to produce a critical mass of staff with renewed interested in PR. In the same way, the perception of CIP staff that CARE was only an extension organization began to change, and CARE staff began to be interested in participatory, adaptive research in addition to their extension responsibilities.

At the end of the first phase of collaboration, the results of interactive learning started to pay off for both institutions. CARE-CIP interaction during this initial phase was regarded as positive and beneficial for farmers and for both institutions. In economic terms, Ortiz et al (1996) indicate that this project yielded a rate of return on investment of about 30%, which compares favorably with other investments in agricultural research; and that, in practical terms, it generated a benefit for farmers of between US$ 100 to US$175 per hectare per year (Ortiz et al.; 1996, Chiri et al.; 1995, Chiri et al.;

1996). However, issues related to measuring other types of changes such as those related to human and social capitals were just beginning to be discussed. Ortiz (1997) also concludes that an important result of the collaborative project was the enhancement of farmers' knowledge and decision-making process for potato pest control, and also the enhancement of technical and methodological knowledge on the part of CARE extension workers. The improvement in technical knowledge was the result of interaction with CIP researchers; but the improvement in methodological knowledge, which included ways and means of teaching IPM to farmers, was the result of their own experience. These new capabilities within CARE were reflected in the replication of the MIP-Andes experience within a larger project that CARE had with the Peruvian Government, called the Altura project, through which CARE supported staff from a large government soil-conservation project that also included IPM information that was disseminated to eleven additional sites in the Peruvian Andes.

The learning process also generated benefits for researchers, who started to realize that IPM was a knowledge-intensive technology, which required the development of specific participatory research and training methods (Ortiz et al., 1997; Ortiz, 2001). In addition, it was clear to both institutions that working together generated a number of positive effects, so it was desirable to maintain the relationship. However, one of the weaknesses of the first phase was that the lessons learned in methodological terms were not documented and the richness of the experience of researchers and, particularly, extension workers remained limited to the individuals, who unfortunately in the case of CARE started to move to other institutions because of changes in the institution. In the case of CIP, documentation was also limited; it focused on documenting the technical aspects and the economic impact of technologies, but less attention was given to documenting methodology.

Ortiz (1997) identified some factors that facilitated the CARE-CIP relationship, such as the existence of a suitable environment for cooperation within both institutions, the existence of information supply and demand concerning a particular problem (potato IPM), the compatibility of organizational objectives and the need to formalize information transfer. However, the same author indicates that there were also some factors that delayed or limited the interaction. Limiting factors included the rigidity of organizational structures, usually designed to implement projects within the institutions, but not with collaborators, the lack of financial support to cover interaction costs, which were underestimated in the initial proposal, and a misunderstanding of goals, activities and roles. The main donor that financed the interaction CARE-CIP was USAID, the administrator of the grant was CARE, and CIP was sub-contracted (a new experience for CIP for this type of work), which initially created power struggles regarding decision making and controlling financial resources. This type of conflicts usually happens among institutions that compete for the same type of resources (Bennell, 1990).

The "action-learning period"

The lessons learned during the first phase of collaboration influenced the evolution of the collaborative learning environment in the second phase of collaboration (1997-2002). We call this phase "action-learning period". Some of the lessons from the first period that influenced the second period included the realization that information and technology transfer were not enough to adapt a technology to variable agro-ecological and socioeconomic conditions, and that fine-tuning and adaptation of technologies and methods were needed. In addition, because of the complexity of information related to IPM, both institutions agreed that suitable methods of fostering farmers' learning should be developed. Hence another collaborative learning period started when both institutions agreed to embark on a new experience related to adapting participatory research and training methods for IPM (and learn from the process proactively). This experience was specifically related to the adaptation of the FFS approach to solving problems caused by potato late blight, an endemic disease in the Andean region of Peru that had become significantly more challenging to farmers because of global pathogen migration (Fry et al., 1993). Therefore, using the terms of Douthwaite (2002), a process of learning selection started and the FFS was identified at that time as the "best bet" in methodological terms. The process was facilitated by a "champion" who had recently joined CIP and brought her experience related to FFS adapted to crop disease management from Asia (Nelson et al 2001). An additional difference was that CIP gave priority to controlling potato late blight, for which resistant varieties of potatoes were available from CIP and national counterparts. Although resistant varieties were available, their performance and management requirements were strongly influenced by site-specific conditions, which reinforced the need to work with PR (Ortiz et al., 2004). Therefore, in this phase, neither CIP nor CARE had a "technology package" ready to transfer, nor felt that this was a desirable objective. On the contrary, there was an agreement to develop a locally responsive approach and that both institutions should learn in the process.

At the end of the first phase, and during the beginning of the second phase, both institutions also realized that the inter-institutional relationship should be maintained because of the benefits generated; but that was not a specific decision to ensure the continuation of the learning process, which was not consciously made until the third learning period in recent years. As a result, CARE and CIP signed a permanent agreement for collaboration in 1996, which was established as a framework for collaboration. The need to work with a long-term approach for collaboration is called "long-termism" by Lundvall et al. (2002) and is regarded as a precondition to promoting interactive learning. This principle has been confirmed in the CIP-CARE case. Although at that time, participants were not yet aware that a specific interactive learning process was taking place as a result of collaborative work and it was difficult for individuals and organizations to visualize the enhancement of human capital, which started to become clearer as the inter-institutional relationship was maintained for a longer period. The lack of visibility of lessons could be a constraint for institutional

learning because many of the lessons learned and the new capabilities developed remained implicit within individuals, and did not become explicit until there was a specific effort to document a particular experience, which started to occur during the second period.

As indicated above, during the second phase or "action-learning period", both institutions initiated the adaptation of the farmer field school (FFS) approach, including a strong component of participatory research (PR) to deal with potato-related problems, particularly the late blight disease. Therefore, the "learning selection" process (Douthwaite, 2002) began for both organizations, but in this case, instead of passing the innovation (FFS approach) along to other individuals to improve it, it was the same group of individuals – CIP and CARE staff - who learned through several cycles and continuous interaction. As a result, they began to adapt the FFS approach to the potato crop in Cajamarca in the northern Peruvian highlands. This process was supported by a grant provided by the International Fund for Agricultural Development (IFAD) between 1999 and 2002. CIP was the recipient of the grant and in turn sub contracted CARE for the implementation of collaborative activities, which were included within larger CARE development projects. Ortiz et al (2004) indicate that one of the main modifications made to the classic FFS approach as a result of this process was the importance given to participatory research, which was reflected in a change of the name of the approach to participatory research through farmer field schools (FPR-FFS). In retrospect, this could be regarded as a practical application of the convergence of the farmer-participatory extension approaches represented by the conventional FFS with the participatory technology development approach that had worked out well in the CIAL methodology (Braun et al., 2000). This convergence was the natural result of collaboration between research and extension organizations confronting a new problem that required both extensive training of farmers (i.e. for disease management decisions) and extensive technological testing (evaluation of large sets of varieties, breeding lines and fungicide plans in an extremely variable environment).

CIP and CARE staff that had learned a lesson from the lack of documentation of experiences during the first learning period began to pay special attention to documenting their experience, particularly methodological lessons. As a result, specific guidelines were produced including the main methodological lessons related to the implementation of FFS for potato-related problems in the northern highlands of Peru (Bazán et al., 2002). During this period, CIP also paid attention to evaluating approaches more carefully; and different studies that showed the economic benefits of the FPR-FFS approach for farmers were conducted, including attempts to assess changes in human and social capital (Buck, 2001; Zuger 2003, Zuger, 2004; Godtland et al., 2004). The benefit that this kind of approach could provide for research institutions, in terms of producing real world information, was also taken into consideration (Ortiz et al., 2004). However, in both the elaboration of methodological guidelines and the evaluation of the impact, there was a failure to document the processes that made the adaptation of the FFS approach possible within both organizations. In other words, the

questions “How did it happen and what did it mean for CIP or CARE internal strategies?” were not specifically addressed. At the end of the “action learning period”, internal and external institutional contexts began to change substantially. For example, CARE changed its approach from providing specific technical assistance to fostering the improvement of local actors’ abilities, using market-oriented approaches, and was slowly terminating direct extension intervention. CIP was also in the process of reflecting on how to enhance its role in alleviating poverty.

As indicated above, interactive learning was fostered more consciously during this phase, with the idea of gaining and documenting knowledge. Periodic meetings were scheduled to analyze the progress of the collaborative project and the changes that affected the collaboration. Feedback was also received during the meetings about methods and technologies. Lessons suggested that more integral approaches were needed for working with farmers and, as a result, the initial approach to control a specific potato disease was replaced with integrated crop management (ICM), going beyond pest and disease control to more holistic crop management.

CARE had a number of projects using different approaches such as market promotion and entrepreneurial activities. This information reached the FFS team and as a result, CARE extension workers, who in this period were called facilitators, began to discuss the need to include market aspects within FFS projects. This was one of the results of the osmosis of information.

Lessons also showed that the interactive learning process generated by collaborative activities was strongly affected by other activities carried out within institutions. For example, in the case of CARE, FFS-related activities were part of a large development-oriented project aimed at increasing the productivity of crops and livestock, including providing credit. In practice, this meant that CARE extension workers or facilitators had a number of activities to carry out, and that FFS-related activities were just part of them. This was a negative factor, because extension workers had to play a double role: facilitators in the potato FFS, but conventional extension workers for other activities. As a result there was a conflict of interest, and they tended to give more importance to activities that were 100% within CARE control than to activities conducted in collaboration with CIP. In the case of CIP, a similar situation occurred. The inter-institutional activities related to participatory research were seen as “extension” and, therefore, did not have the same importance as typical research activities conducted within CIP. This situation suggested that modifications in the strategic operational plans of institutions were needed so that collaborative, inter-institutional activities had the same importance as activities included in the working plans of each institution.

At the end of the second phase of collaboration, some conscious decisions began to be made according to the lessons learned by both organizations. For example, some ideas were discussed and specific actions were taken to include participatory research and training activities (generated by the FFS experience) in other CARE projects with an

orientation toward promoting market linkages and commercialization. This was the specific case of the use of the FFS approach in a project to promote the production and commercialization of a native fruit tree in the Cajamarca area. This was another visible result of the information osmosis between the CIP-CARE FFS team and other CARE teams. Additional lessons from this phase of collaboration indicated that institutions should consider scaling-up and out issues (Cook and Fujisaku, 2004) more carefully, instead of assuming that good experiences would be replicated automatically. In addition, it was clear to both organizations that despite the positive results of collaboration, there were many other governmental and non-governmental organizations that needed innovative ways of working with farmers. Therefore, the involvement of more organizations was desirable to achieve a meaningful impact.

As a result of the "action-learning period", ideas related to how to promote analysis and learning by organizations to make decisions regarding the use of PR methods, technologies, and particularly scaling-up and out challenges began to be discussed. The importance of accessing information on new methods from external sources was recognized, but also, and more importantly, the need to generate experiences within the organizations. In this way, individuals and groups produced information about the usefulness of new ideas by themselves, and they became the centers of information osmosis for the rest of the institution. The conclusion was that institutions should not adopt new methods or approaches only due to external influence, but as a result of their own internal or inter-institutional learning process. A clear difference compared to the "information transfer period" was that roles of both institutions became more flexible with no clearly identified sources or users of innovation, rather innovators through interaction. During the second period of collaboration, the perception of CIP's role in the interaction changed from source of information to a broker of information, meaning that not only CIP-related technologies or information were proposed, but information and technologies coming from any source, recognizing the fact that there are multiple sources of information and innovation in the system. However, this change is still slow and difficult for scientists to assume.

The "social learning" period

During the previous "action-learning" period, the need to consider the complexity of the organizational and institutional context in which both institutions were working was gaining importance within CARE and CIP. For CARE, the change was more tangible. It switched to approaches oriented toward human rights and the promotion of self-empowerment to increase the capacities of local actors (i.e. other institutions, grass root organizations, farming communities or local governments), instead of implementing actions directly. In addition, the challenge of scaling-up and moving beyond the pilot-area syndrome was regarded as an important step forward for the relationship between the organizations. At the same time, the CIP team from the newly created Integrated Crop Management Division started to consider the diversity of institutional actors and analyze strategies to strengthen potato-related knowledge and information systems. The

third phase of collaboration started in 2004, and can be identified as the "social learning period" This period is being supported by another grant provided by IFAD. The main objectives of this phase are related to promoting more conscious and planned interactive and mutual learning processes among a larger set of institutions. The idea was that institutions themselves should start generating their own lessons, and transform those into guidelines for making appropriate decisions about what types of methods and technologies they should prioritize.

During the current "action-learning period", organizations are involved in inter-institutional, collaborative activities, which have been designed purposefully to be parallel learning cycles in order to extract and document lessons, including not only CARE and CIP but also other local organizations such as local municipalities (which have begun to be involved in promoting agricultural development), and other NGOs and grass root organizations, such as the association of farmer field schools of San Miguel (result of the second phase of collaboration). In this Period, the interactive learning process is not being repeated just within CIP and CARE but also within five additional organizations. However, they are just a small sample of the complexity of the current Peruvian research and extension system, and the challenge to scale-up and out methods and technologies persists. The IFAD grant is helping institutions to analyze what types of participatory methods are appropriate according to types of technologies (input-based or knowledge intensive), and particularly according to local institutional and inter-institutional contexts. This new period is particularly special for CIP because of its new vision (CIP, 2004), in which there is an institutional commitment to contributing toward achieving the Millennium Development Goals. CIP is analyzing its role and it is clear that it cannot act alone if it wants to contribute toward achieving the Goals of the Millennium in a meaningful way. Partnership has a new and more important meaning during the current period of collaboration. The experience of development-oriented institutions is essential for this phase, because they know the strategies in more detail, and particularly the "hidden" costs involved in different participatory methods when applied to development aiming at scaling–up and out; something that is not easily perceived by research institutions such as CIP. The CARE contribution at this stage is essential to documentation and the generation of guidelines for decision-making. However, it has been observed that the staffs of the organizations have difficulties allocating time for monitoring and evaluation. Therefore, allocating time for institutional learning would become an even more critical factor to be taken into consideration by mangers, particularly because of the accelerated current pace of work.

During the current period, the lessons learned by CARE and CIP during previous phases are being shared with other organizational actors. Therefore, parallel and mutual learning has increased in complexity because other institutions with different backgrounds are involved in the process. Some preliminary observations indicate that collaborative activities not only generate interactive learning among the institutions involved. Because of the diversity of activities within institutions (currently very few institutions specialize only in just one particular activity, such as agricultural extension),

they also nurture parallel learning cycles of other groups within institutions. For example, methods used in agricultural development can be adapted for use in health promotion and vice versa. As indicated before, there is a process of osmosis of information, which is similar to that in biology, but instead of a flow of nutrients, ions or other substances from areas with higher concentration to areas with lower concentration, it is information which flows from groups with more experience on specific subjects, methods or approaches, to other groups within the same institution, and more importantly, to groups in other institutions. An example of this process within CARE is that the experience with FFS in collaboration with CIP was a small part of a larger development project of the Cajamarca office, but because of the osmosis process (not necessarily because there was an institutional decision to promote it), other projects within the same area started to receive information, learn and increase their own experience. The osmosis of information related to FFS influenced other projects related to livestock management and also to promoting the production and commercialization of agricultural produce. Within CIP, a similar process occurred. Initially there was one group using FFS with sweet potatoes in Indonesia and the Philippines; then the Andean potato group also made its contribution to the adaptation of the approach in Peru, Bolivia and Ecuador. Slowly, the osmosis process generated the sharing of information and replications in other countries such as Uganda, Kenya, Tanzania (Stathers et al, 2005), Ethiopia, China and Bangladesh.

Another important process associated with the osmosis of information has been the mobility of CARE staff. During the "action-learning period", a group of six staff members participated actively in the adaptation of the FFS approach. Since 2000, these individuals started to move to other institutions, taking with them knowledge gained as a result of interactive learning. Therefore, the osmosis of information has influenced other institutions and resulted in the use of the FFS approach in different settings in Peru, such as in a number of institutions that participated in the IPM-FFS project coordinated by FAO in Peru (Groeneweg et al., 2004).

When osmosis of information occurs, the tendency is that, the closer the people are to the center of the origin of ideas (higher concentration of information) within or between institutions, the more accurate the information that they receive is. But when individuals or institutions are relatively far from the center of origin, incomplete information tends to be disseminated. In the case of CARE, FFS-related information was easily shared with other CARE teams in the Cajamarca region and in some cases this generated the implementation of the approach for dealing with other agricultural problems. But this did not occur in other CARE offices located far away from Cajamarca, where the information was just partially understood, and, although, there was interest, no specific implementation took place. In the case of CIP, the late blight team was the center of origin of the FFS information for the Andean region, and other teams closely related initiated the adaptation to the approach, such as the teams working with bacterial wilt and insect control (all of them currently belonging to the same research division), but less use of the approach has occurred in other research divisions.

The osmosis phenomenon explained above has implications for promoting institutional learning. For example, a more efficient mechanism for sharing lessons generated by one group within an institution would be to assign staff from other areas closer to the center of the origin of information, meaning that the staff would share time on different projects or programs. In other words, instead of giving a presentation to colleagues about an experience, or asking them to read a report, the idea would be to invite people to work and learn first hand. Our experience has shown that individuals (staff within organizations) do not adopt an approach unless they have had a learning experience, meaning actual implementation or use of the approach in practical terms. This phenomenon has also been pointed out by Gurung and Menter (2004). In the same way that farmers want to test a new technology or innovation first and see if the new idea has comparative advantages, if it is compatible with values, if it has visible effects, if it is simple or complex (important characteristics of innovations noted by Rogers, 1994), extension workers or researchers take similar criteria before making decisions to adopt a new method. One important characteristic indicated by Rogers (1994) refers to "triability", or the possibility of limited experimenting with an innovation before scaling-up. This characteristic seems to be very important for institutions, because unless a method is tested in a specific context (pilot areas, pilot communities, etc.) and a learning experience occurs, it is improbable that other staff members from institutions will adopt new methods.

The "social learning period" is aimed at providing institutions with the opportunity to try new methods on a limited scale and undergo a learning experience before proceeding to apply knowledge on a larger scale. As indicated before, evidence from this period suggests that the degree of complexity of interactive learning (parallel or mutual learning) increases with the number of institutions involved, because institutional contexts influence the way in which specific methods or strategies are used. During the "social learning period", for approaches such as the agricultural knowledge and information system (Engel, 1997), innovation systems (Biggs, 1990; Biggs and Matsaert, 2004; Lundvall et al., 2002) have begun to be taken into consideration. CIP and CARE teams involved in the learning experience have realized that innovation processes directed towards achieving Millennium Development Goals require greater involvement of local actors and an enhancement of the ways they interact for scientific information to be meaningful. However, challenges also arise because measuring institutional learning and the benefits derived from it is a complex process with difficulties in determining attributions, which makes managerial decisions difficult.

Concluding remarks

The learning cycle of CIP-CARE collaborative work over a decade has generated lessons that have led to changes in the way the teams of both institutions operate and interact, from information transfer to action-learning, and finally the promotion of social learning. The evolution of these learning periods was facilitated by collaborative

participatory work and provided important feedback for the internal processes of both institutions, within which the role of participatory research has been debated continuously. Participatory research has therefore contributed to create an interactive and collaborative learning environment for both organizations.

During the evolution of the learning periods, CIP and CARE staff passed from conducting "decision-oriented research" (Leewuis, 2004) in the information transfer period, in which the objective was how to disseminate and implement IPM better, to "conceptual research" oriented toward questioning, conceptualizing and theorizing about the use of participatory methods in the social learning period. However, there have been differences between the two organizations. For example, CARE staff has been more interested in "decision-oriented research" to guide their operations, whereas CIP has been more interested in "conceptual research" because of its orientation toward developing public goods. But, because of interactive learning, CARE has moved toward conceptual research to understand processes, and CIP has moved toward decision-oriented research in order to attain a better understanding of the influence of research on development.

There are factors that have been changing during the three periods of interaction. Some factors that have changed in a positive way or have improved over time are trust, flexibility and innovativeness. Trust has been built over time through interactive learning, personal contact and the fulfillment of commitments. Flexibility has also improved because the perception of roles (either source: disseminator or user) established at the beginning changed over time, and also institutional structures have changed to allow smoother interaction. During the social learning period, the aim is for all participants to be at the same time sources (through interactive learning), disseminators (osmosis of information), analyzers and users (improved decision-making). Another way of looking at changes in roles can be described using the terms provided by Lundvall et al. (2002). During the information transfer period, the perceived roles of "pioneers" (researchers) on the one hand, and "imitators" (extension workers and farmers) on the other prevailed. During the action-learning period, roles shifted to "adaptationists" (researchers and extension workers), and in some cases "complementors" (extension workers). During the social learning period, the roles of "adaptationists" and "complementors" became clearer, but "mixed strategies" (changing roles) for innovation according to circumstances are also being used. Last but not least, innovativeness has also changed over the years and the staffs of CARE, CIP and, recently, other organizations have realized that learning is needed to find answers to many complex questions related to agricultural development and the role of research in it, and that there is no correct answer beforehand. On the contrary, everything has to be tested against reality.

Other factors have changed and affected the learning process in a negative way. For example, instability has increased within institutions and also in the context. Many of the CARE staff that participated and learned during the process had to join other

institutions, interrupting a cumulative learning process. Within CIP also, some staff left, others had to assume different positions, also interrupting a cumulative learning process. Although staff mobility is useful for promoting the osmosis of information, it also interrupts learning and prevents building on past experiences, particularly when lessons have not been documented and shared within and among institutions. Fortunately, a small number of employees of both institutions remained and they have been the champions of learning throughout the three periods of interaction.

For people (individuals, groups or organizations) to innovate, they need to be exposed to, and participate actively in, a learning process of doing, testing, using evaluating and making sense of a particular innovation (especially new methods). It is improbable that individuals or groups will innovate and change without experimenting in the real world. This has implications for the institutionalization of participatory approaches, which should be implemented not just by providing training or information, but also by generating learning experiences for people and organizations. The challenge for organizations promoting participatory research is how to provide meaningful learning experiences (for internal and external staff), so that the decision to innovate concerning methods and technologies comes from practice and not from theory.

The interaction of CARE and CIP for over a decade is an example of a learning experience facilitated by participatory research that has been evolving over time and has shown that both research and development oriented organizations should look for opportunities to interact and learn from each other, and particularly to learn from collaborative experiences. But specific mechanisms should be put in place, so that the collaborative experience is documented and the learning process enhanced. Hence, institutional learning (particularly to retain the benefits of unplanned lessons or results not included in initial logic frameworks) should be planned and promoted, and not just left to chance. Periodically, institutions should stop and ask themselves "what we have learned so far?" and use the answers to adjust future strategies. Organizations need to create mechanisms to reduce the implementation syndrome, which presses people to concentrate on short-term goals, but prevents reflecting on, and making sense of, experiences in order to use new knowledge for decision-making, which is even more critical at times when institutional agendas tend to expand and include new challenges.

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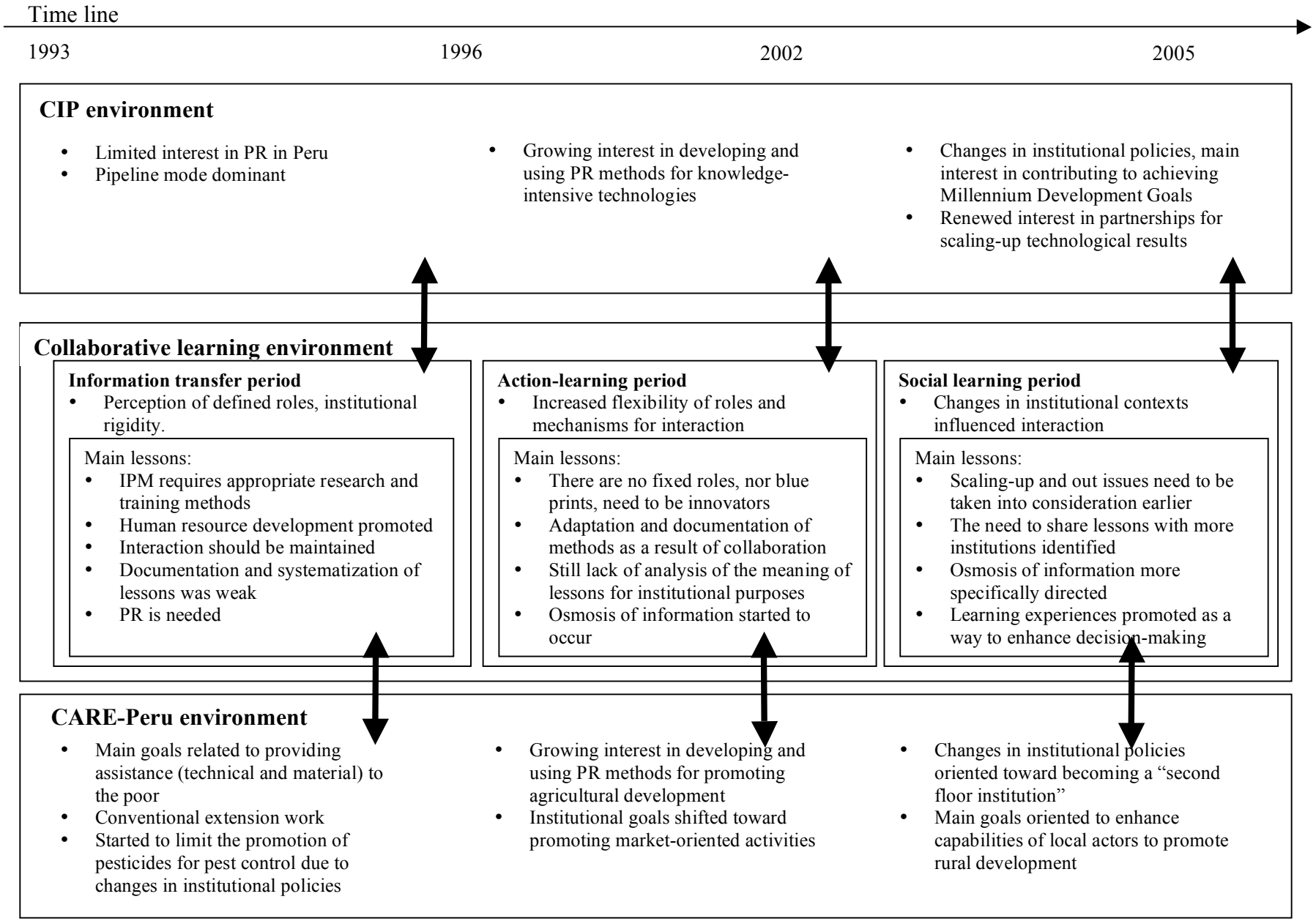

Figure 1: Evolution of the collaborative learning environment of the CIP-CARE relationship in Peru influencing and influenced by institutional environments